



INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference CP00098 WO	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP 03/07217	International filing date (day/month/year) 05.07.2003	Priority date (day/month/year) 16.07.2002
International Patent Classification (IPC) or both national classification and IPC B26F1/24		
Applicant COROVIN GMBH et al.		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 7 sheets, including this cover sheet.  
  
☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
  
 These annexes consist of a total of 10 sheets.

- This report contains indications relating to the following items:
  - ☒ Basis of the opinion
  - ☐ Priority
  - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - ☐ Lack of unity of invention
  - ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - ☐ Certain documents cited
  - ☐ Certain defects in the international application
  - ☐ Certain observations on the international application

Date of submission of the demand  28.01.2004	Date of completion of this report  13.10.2004
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Demay, S  Telephone No. +49 89 2399-7151 

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/EP 03/07217**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*):

**Description, Pages**

2-16 as originally filed  
1, 1a, 1b, 1c, 1d received on 28.04.2004 with letter of 26.04.2004

**Claims, Numbers**

1-23, 27 received on 28.04.2004 with letter of 26.04.2004

**Drawings, Sheets**

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☒ the claims, Nos.: 24,25,26,28,29  
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-23,27
	No: Claims	
Inventive step (IS)	Yes: Claims	1-23,27
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-23,27
	No: Claims	

2. Citations and explanations

**see separate sheet**

**Re Item V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: EP-A-0 598 970 (PANTEX SRL) 1 June 1994 (1994-06-01)
- D2: EP-A-1 046 479 (BURCKHARDT CHRISTOPH AG) 25 October 2000 (2000-10-25) cited in the application
- D3: EP-A-0 214 608 (KIMBERLY CLARK CO) 18 March 1987 (1987-03-18)

**1°- Novelty and inventive step of claim 1**

Subject matter of claim 1 pertains to a method for the manufacture of a perforated nonwoven, whereby perforation means engage into the nonwoven. The perforation means are arranged on a first roller, engage through the nonwoven, displace the fibres of the nonwoven, and engage in a material on the second roller, which they can displace during the engagement, and whereby contours are formed in the material.

The cited documents D1 and D2 disclose method for the manufacture of a perforated nonwoven.

However, the method disclosed in document D1 does not involve an engagement of the perforation means ("projections") through the nonwoven to be perforated. Indeed, D1 teaches that the perforations result from the fact that the cylinder having the projections (Fig. 1, "7") turns at a greater peripheral speed than the peripheral speed of the smooth cylinder (D1, claim 13; Fig. 1, "5"; col. 1, l. 53 to col. 2, l. 11). Consequently, the perforation means do not engage in a material covering the smooth roller (D1, claim 20) and thus do not displace it during the engagement, as required by claim 1 of the present application.

Concerning the method for the manufacture of a perforated nonwoven disclosed in D2, it does not involve the engagement of the perforations means through a material covering the second roller and the displacement of this material during the engagement. Indeed, the needles used in D2 as perforation means engage in holes preformed in the material (metal or rubber) forming/wrapping the second cylinder.

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Accordingly novelty is acknowledged (Art. 33(2) PCT).

There is no documents cited in the ISR disclosing or suggesting a method for the manufacture of a perforated nonwoven, whereby the perforation means disposed on a first roller engage through the nonwoven to be perforated and through a material covering a second roller (counter-roller), this material being displaced by the engagement and whereby contours are formed in the material.

Technical benefits of such a teaching lies in the fact that little consideration must be taken of temperature expansion of the perforation means (needles) and that the perforation means (needles) and the engagement points in the material covering the counter-roller (felt) are automatically synchronized. As a consequence, higher speed of manufacturing is possible.

Therefore, in view of this, an inventive step must be conceded (Art. 33(3) PCT).

**2°- Dependent claims 2-9**

The claims 2-9 being dependent on claim 1, they are novel and inventive (Art. 33(2) and (3) PCT)

**3°- Novelty and inventive step of claim 10**

None of the documents cited in the ISR discloses a roll calender for the perforation of a nonwoven as claimed in claim 10 of the present application.

In particular, the examining Authority is of the opinion that the roll calender claimed in claim 10 is not anticipated by D1 because the perforation means are shaped quite differently. In claim 10, perforation means perforate the nonwoven by going through it and engage into the material covering the counter-roller, whereas perforation means disclosed in D1 create a perforation in the nonwoven by the relative slipping action between the two rotating surfaces of the cylinders. Thus, D1 does not cite needles as perforation means, contrary to the present application.

Moreover, D1 is silent on contours formed in the material of the second roller.

Further, the principle used in D1 for performing the perforation of the nonwoven is significantly different from the principle used in the present application. Therefore, no teaching would lead the skilled person to use a counter-roller covered with a material susceptible of being perforated by needles, as disclosed in D1 (Claim 20), in the apparatus disclosed in D2, for instance.

Therefore, subject-matter of claim 10 is novel and inventive (Art. 33(2) and 33(3) PCT).

**4°- Dependent claims 11-23**

The claims 11-23 being dependent on claim 10, they are novel and inventive (Art. 33(2) and (3) PCT)

**5°- Product claim 27**

Product claim 27 has been drafted as a "product by process claim" (Claim 27: "A perforated nonwoven manufactured by a method according to claim 1..."). It is to be noted that a product is not rendered novel and inventive merely by the fact that it is produced by means of a new process, as it is the case with method claim 1 which has been found to be novel and inventive.

However, none of the documents cited in the ISR recites a perforated nonwoven showing a connecting surface which amounts to between 8% and 25%, as claimed in claim 27. In particular, it is stated in D3 that "the degree of openness or perforation on the nonwoven web can range from about 20% to about 55% of the available surface area; the upper practical limit seems to be approximatively 55% due to mechanical/physical limitations of the system." In view of this, the nonwoven claimed in claim 27 displays an enhanced degree of openness or perforation.

Therefore, subject-matter of claim 27 is novel and inventive (Art. 33(2) and 33(3) PCT).

**6°- Industrial Applicability**

For the assessment of the present claims on the question whether they are industrially applicable, no particular reasoning would appear necessary. The industrial applicability would appear to be evident (Art. 33(4) PCT).

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REPLACED BY  
ART 34 AMDT.  
Rec'd PCT/PTO

12 JAN 2005

DEVICE AND METHOD OF LIQUID-PERMEABLE PERFORATION OF A NONWOVEN

The present invention relates to a method of manufacturing a perforated nonwoven, perforation means, particularly needles, engaging in the nonwoven. The needles are positioned on a first roller, the needles engaging through the nonwoven in a surface of a second roller. Furthermore, a roll calender for perforating a nonwoven is provided, the roll calender having a first roller and a second roller. The first roller has perforation means. A perforated nonwoven material is also described, which is produced using a method and/or a roll calender.

Calenders which each have a needle roller and a perforated roller are described in European Patent Application 1 048 419 A1 and in European Patent Application 1 046 479 A1. The needles of the needle roller engage in the corresponding diametrically opposite openings of the perforated roller and are thus capable of perforating material guided through the gap formed by the perforated roller and the needle roller. Materials which may be perforated are to be plastic films, paper, or nonwoven materials. The latter are to be able to be up to a few millimeters thick.

The object of the present invention is to provide a method and a device which allow the technical outlay for manufacturing perforated nonwoven to be kept low, but simultaneously allow high production speed.

This object is achieved by a method of manufacturing a perforated nonwoven having the features of Claim 1 and by a roll calender for perforating a nonwoven having the features of Claim 10. Further advantageous embodiments are specified in the particular subclaims.



ART 34 AMDT

CLAIMS

1. A method for the manufacture of a perforated nonwoven (2), whereby perforation means engage into the nonwoven, the perforation means are arranged on a first roller (8), and the perforation means engage through the nonwoven into a surface (15) of a second roller (10),  
characterised in that  
the perforation means displace the fibres of the nonwoven, whereby the perforation means engage in a material on the second roller (10), which they can displace during the engagement.
2. The method according to Claim 1, characterised in that the perforation means engage into an at least partially fibrous material, which for preference forms the surface of the second roller (10).
3. The method according to Claim 1, characterised in that the perforation means are heated up to a temperature which is below a melt temperature of the nonwoven or a decomposition temperature of the material.
4. The method according to Claim 1, 2 or 3, characterised in that a felt material (11) is used.
5. The method according to Claim 4, characterised in that the felt material (11) is located onto the second roller (10) as a shrinkage hose-type covering.
6. The method according to one of the foregoing Claims, characterised in that the perforation means displace the fibres of the nonwoven and push against the material (11), whereby the fibres are compacted and an opening in the nonwoven is stabilised.

7. The method according to Claim 6, characterised in that, when the perforation means engage, fibres are at least in part forced out of the nonwoven, whereby the fibres form a structure which correspondingly exhibits a geometry of the perforation means, which, after the nonwoven has run through the first (8) and second (10) roll, rises from a surface of the nonwoven.
8. The method according to Claim 6 or 7, characterised in that, when the perforation means engage into the material, fibres are at least in part drawn in sympathy into the material.
9. The method according to one of the foregoing Claims, characterised in that the perforated nonwoven (2) is detected.
10. A roll calender (7) for the perforation of a nonwoven, whereby the roll calender (7) exhibits a first (8) and a second (10) roller, the first roller (8) has perforation means which project from a surface of the first roller (8), and the first (8) and the second (10) rollers form a gap (16), through which the nonwoven which is to be perforated is guided, characterised in that the second roller (10) exhibits a material (11) as its surface which can be displaced by the perforation means, whereby the gap (16) is set in such a way that the perforation means engage into the material.
11. The roll calender (7) according to Claim 10, characterised in that the gap (16) is capable of being changed.
12. The roll calender according to Claim 10 or 11, characterised in that the material exhibits fibres at least in part.

13. The roll calender according to Claim 10, 11, or 12, characterised in that the material exhibits a felt material (11).
14. The roll calender (7) according to Claim 13, characterised in that the felt material (11) exhibits a thickness of at least 6 mm.
15. The roll calender (7) according to Claim 13 or 14, characterised in that the felt material (11) is a shrinkage hose covering.
16. The roll calender (7) according to Claim 13 to 15, characterised in that the felt material (11) is arranged under mechanical tension on the second roll (10).
17. The roll calender (7) according to one of Claims 13 to 16, characterised in that a connection material is applied on the second roll (10), which creates a connection between the felt material (11) and the second roll (10).
18. The roll calender (7) according to one of Claims 10 to 17, characterised in that the second roll (10) is driven.
19. The roll calender (7) according to one of Claims 10 to 18, characterised in that the perforation means are needles (9) which are capable of perforating the nonwoven in such a way as to render it permeable to fluids.
20. The roll calender (7) according to one of Claims 10 to 19, characterised in that a carrier is drawn onto the second roller (10), on which the material (11)

is arranged.

21. The roll calender (7) according to one of Claims 10 to 20, characterised in that a detector unit is arranged at the roll calender (7), which detects the perforated nonwoven.
22. The roll calender (7) according to one of Claims 10 to 21, characterised in that the roll calender (7) exhibits a changeover device for changing the second roller (10) which is engaged with the first roller (8) by a third roller.
23. The roll calender (7) according to one of Claims 10 to 22, characterised in that the roll calender (7) exhibits a lateral possibility of access at the second roll (10) for drawing the felt material (11) up and off.
24. A material for use on a counter roll of a perforation roll, characterised in that the material exhibits felt material (11), which is located on a carrier.
25. The material according to Claim 24, characterised in that the material is located on a changeover bobbin.
26. A use of a felt material (11) as a surface material for a counter roll of a perforation roll.
27. A perforated nonwoven manufactured by a method according to Claim 1 and/or with a calender roll (7) according to Claim 10, characterised in that the nonwoven exhibits a basic weight of between 20 g/m<sup>2</sup> and 40 g/m<sup>2</sup>, has a connecting surface which amounts to between 8 % and 25 %, and exhibits perforations which are approximately circular, whereby a diameter of a perforation is between 0.1 cm and 2.0 cm.

28. The perforated nonwoven according to Claim 27, characterised in that the nonwoven is a single-layer spunbonded nonwoven, which is at least predominantly manufactured from polypropylene.
29. The perforated nonwoven according to Claim 27, characterised in that the nonwoven is a two-layer spunbonded nonwoven, whereby a first layer has a spunbonded nonwoven which exhibits polypropylene, and a second layer exhibits a material which is at least a bi-component material.